REMARKS

Claims 1-5, 7-18, and 20, all the claims pending in the application, stand rejected on prior art grounds. In addition, the drawings and specification are objected to. Applicants respectfully traverse these objections/rejections based on the following discussion.

I. The Prior Art Rejections

Claims 1, 2, 5, 7-18 and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Eklund (US Patent No. 5,087,580) in view of Peidous (US Patent No. 6,001,700) and further in view of Blair (US Patent No. 5,904,536). Claims 7 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Eklund in view of Blair and Miwa et al. (US Patent No. 5,352,624). Applicants respectfully traverse these rejections based on the following discussion.

A. The Rejection Based on Eklund in view of Peidous and Blair

The Eklund reference is utilized in the rejection to show some basics regarding the simultaneous formation of vertical bipolar transistors and CMOS transistors. However, the Office Action admits that Eklund it is deficient in teaching a number of features of the claimed invention. One of these features is that the emitter is formed in a damascene process and the Office Action refers to Blair for teaching such a process.

The Office Action also makes reference to Peidous as disclosing the implanting of the collector and the base through a single mask. Peidous utilizes an unusual field oxide 16 that is formed to have regions of different thicknesses (18, 20, 22) and shown in Figure 7A. Column 6, lines 61-64 explain that the multi-thickness oxide is required so that when the various implants are made, the collector (C), the base (B), and the emitter (E) (shown in Figure 8A) are properly

formed. An elaborate LOCOS process described in column 5, line 35-column 6, line 24 must be performed in order to form the multi-thickness oxide 16.

To the contrary, as shown in Applicants' Figure 1, the invention uses a single-thickness oxide 18 through which the implants 19 are made to form the collector 14 and the base 16 in the present invention. This feature is defined by independent claims 1, 11, 12, and 14 as follows "forming a single-thickness oxide over said substrate; forming a single mask over said single-thickness oxide; performing multiple implants through said single mask to form a base layer over a collector layer within said substrate" and is similarly defined by independent claim 18. The claimed invention is superior to the processing that would be required through the combination of Eklund, Blair and Peidous because the claimed invention omits the need to perform the elaborate LOCOS processing steps that are utilized in Peidous to create the multi-thickness oxide. Therefore, Applicants submit that even if one ordinarily skilled in the art had combined the references as suggested in the Office Action, the proposed combination would not teach or suggest the invention defined by Applicants' independent claims.

Further, Applicants submit that the rejection is defective because a prima facie case of obviousness has not been set forth. More specifically, there is no teaching or suggestion in any of the references that would motivate one ordinarily skilled in the art to make the combination proposed by the Examiner. The large number of deficiencies in the primary Eklund reference demonstrates that the Examiner is merely "picking and choosing" from the bin of parts provided by the prior art in order to recreate Applicants' invention based solely on hindsight. There is no independent teaching within any of the prior of record that would motivate one ordinarily skilled in the art to combine the references in the way that the Office Action has done, which indicates that the rejection is based upon hindsight reasoning. While any obviousness rejection involves some aspect of hindsight reasoning, there must be at least some motivation within the references themselves (or some extraneous reference) that would indicate that one ordinarily skilled in the art would have been motivated to make the proposed combination. Applicants respectfully submit that in this instance, the substantial deficiencies in the Eklund reference along with the

large number (3) of references that need to be combined in the present rejection indicates an excessive amount of hindsight reasoning.

In further support of the argument that the rejection is based upon hindsight reasoning, Applicants note that Eklund teaches away from Peidous because Eklund specifically requires separate masks for the formation of the different aspects of the bipolar transistor. Therefore, Eklund teaches away from Peidous, and the two cannot be properly combined. Similarly, Blair teaches away from Peidous because Peidous requires that the emitter must be formed in an ion implantation process, while Blair requires that a damascene process be used. These teachings are opposite one another and, therefore, the references teach away from each other. Such "teaching away" is classical evidence of hindsight reasoning, and Applicants submit that this further demonstrates why a prime facie case of obviousness has not been set forth.

Therefore, as shown above, this rejection is defective because the references are not properly combinable and, even if the references would have been combined, they do not teach or suggest "forming a single-thickness oxide over said substrate; forming a single mask over said single-thickness oxide; performing multiple implants through said single mask to form a base layer over a collector layer within said substrate" as defined by independent claims 1, 11, 12, 14, and similarly defined by independent claim 18. It is Applicants' position that the independent claims are patentable over the proposed combination of Eklund, Blair, and Peidous. Further, dependent claims 2, 5, 7-10, 13, 15-17, and 20 are similarly patentable, not only by virtue of their dependency from a patentable independent claim, but also by virtue of the additional features of the invention they define. In view the forgoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

B. The Rejection Based on Eklund in view of Blair in view of Miwa

Miwa is combined with Blair and Eklund in order to reject dependent claim 3. More specifically, the Office Action argues that Miwa discloses that annealing process to create the

emitter diffusion region. Applicants respectfully submit that this rejection is defective because the Peidous reference is not included in the rejection and because the rejection is based upon hindsight reasoning.

Claim 3 depends from independent claim 1. Since the rejection of independent claim 1 required the Peidous reference, a rejection of dependent claim 3 must logically require the application of this reference. The absence of the Peidous reference makes this rejection logically defective, because without the Peidous reference, there is no teaching of the "single mask" aspect of the invention, defined by independent claim 1, which is necessarily included in dependent claim 3.

In addition, Applicants submit that the annealing process required by Miwa is unworkable with the processing described in Eklund and Blair because it is unclear how such an annealing aspect would affect the other implanted dopants. It is highly likely that introducing such an annealing process (without some additional teachings regarding control of the annealing process) would cause undesirable diffusion and reduce yield substantially. Therefore, Applicants respectfully submit that this rejection is defective and request that it be withdrawn.

C. The Rejection Based on Eklund in view of Blair, Peidous, and Horie

Horie is combined with Blair, Pidous, and Eklund in order to reject dependent claim 4. More specifically, the Office Action argues that Horie discloses the use of a second mask in order to implant additional amounts of the second impurity. Applicants respectfully submit that this rejection is defective because the rejection is based upon hindsight reasoning.

Applicants submit that the process required by Horie is unworkable with the processing described in Peidous because such processing would either be substantially altered it is unclear how such additional impurity implant would be affected by the unusual nature of the multi-thickness oxide 16. Without additional teachings as to how such additional impurities could be controlled, the combination of these references would likely produce a non-functioning device or

a device with substantially reduced yield. Therefore, Applicants submit that the proposed combination is improper and is based upon hindsight reasoning because the proposed combination destroys the function of one or both of the references. Therefore, Applicants respectfully submit that this rejection is defective and request that it be withdrawn.

II. Formal Matters and Conclusion

With respect to the objections to the specifications and drawings, the specification and drawings have been amended, above, to overcome these objections. With respect to the objection to the drawings, a Submission of Proposed Drawing Corrections is submitted herewith. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the objections to the specification and drawings.

In view of the foregoing, Applicants submit that claims 1-5, 7-18 and 20, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0456.

Respectfully submitted,

Dated: 4/22/03

Frederick W. Gibb, III
Reg. No. 37,629

McGinn & Gibb, P.L.L.C.
2568-A Riva Road
Suite 304
Annapolis, MD 21401
(301) 261-8071
Customer Number: 29154